

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. – 20. (Cancelled)

21. (New) A polynucleotide of mixed RNA and DNA nucleotide composition comprising an allosteric site and an enzyme domain spatially distinct from said allosteric site, wherein reversible interaction of a chemical effector with the allosteric site on the polynucleotide reversibly alters the cleavage function or configuration of the polynucleotide, wherein the chemical effector is a metal ion or small molecule having a molecular weight of 300 Daltons or less.

22. (New) The polynucleotide of mixed RNA and DNA nucleotide composition of claim 21, wherein the cleavage function or configuration of the polynucleotide is altered in less than 60 minutes after interaction with the chemical effector.

23. (New) A polynucleotide of mixed RNA and DNA nucleotide composition comprising an allosteric site and an enzyme domain spatially distinct from said allosteric site, wherein the rate of catalysis of the enzyme domain is reversibly modulated by interaction with a chemical effector, wherein the chemical effector is a metal ion or small molecule having a molecular weight of 300 Daltons or less.

24. (New) The polynucleotide of mixed RNA and DNA nucleotide composition of claim 23, wherein an observable change in the rate of catalysis of the enzyme domain occurs 6 minutes or less after interaction with the chemical effector.

25. (New) The polynucleotide of mixed RNA and DNA composition of claim 24, wherein the observable change in the rate of catalysis of the enzyme domain occurs in 1 minute or less.

26. (New) The polynucleotide of mixed RNA and DNA composition of claim 23, wherein the rate of catalysis of the enzyme is measured by observing enzyme self-cleavage or substrate cleavage.
27. (New) The polynucleotide of mixed RNA and DNA nucleotide composition according to claims 21 or 23, wherein the chemical effector is a small molecule selected from the group consisting of amino acids, amino acid derivatives, peptides, nucleosides, nucleotides, and steroids.
28. (New) The polynucleotide of mixed RNA and DNA nucleotide composition according to claims 21 or 23, wherein said composition comprises modified nucleotides.
29. (New) A biosensor comprising the polynucleotides of mixed RNA and DNA nucleotide composition according to claims 21 or 23.
30. (New) The biosensor of claim 29, wherein the polynucleotide of mixed RNA and DNA composition is attached to a solid support.
31. (New) A method for detecting the presence or absence of a compound or its concentration in a sample, comprising the step of:
contacting the sample with a polynucleotide of mixed RNA and DNA composition, said polynucleotide comprising an allosteric site and an enzyme domain spatially distinct from said allosteric site, wherein reversible interaction of the compound with the allosteric site on the polynucleotide alters the cleavage function or configuration of the polynucleotide relative to that of a control sample, wherein the chemical effector is a metal ion or small molecule having a molecular weight of 300 Daltons or less; and further wherein an alteration in function or configuration of the polynucleotide indicates the presence or absence of a compound or its concentration in the sample.

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32. (New) The method of claim 31, wherein the presence or absence of a compound or its concentration is detected by observation of an alteration in the cleavage function of the polynucleotide.
33. (New) The method of claim 31, wherein the chemical effector is a small molecule selected from the group consisting of amino acids, acid derivatives, peptides, nucleosides, nucleotides, and steroids.
34. (New) A polynucleotide of mixed RNA and DNA composition, said polynucleotide comprising an allosteric site and an enzyme domain spatially distinct from said allosteric site, having three stem components, stem I, stem II and stem III, wherein stem I and stem III are polynucleotide sequences which together form the enzyme domain and stem II is a polynucleotide sequence which forms the allosteric site, wherein interaction of a chemical effector with the allosteric site reversibly alters the cleavage function or configuration of the polynucleotide, further wherein the chemical effector is a metal ion or a small molecule having a molecular weight of 300 Daltons or less.
35. (New) The polynucleotide according to claim 34, wherein the cleavage function or configuration of the polynucleotide is altered in less than 60 minutes after interaction with the chemical effector.
36. (New) A polynucleotide of mixed RNA and DNA composition, said polynucleotide comprising an allosteric site and an enzyme domain spatially distinct from said allosteric site, having three stem components, stem I, stem II and stem III, wherein stem I and stem III are polynucleotide sequences which together form the enzyme domain and stem II is a polynucleotide sequence which forms the allosteric site, wherein interaction of a chemical effector with the allosteric site reversibly modulates the rate of catalysis of the polynucleotide, further wherein the chemical effector is a metal ion or a small molecule having a molecular weight of 300 Daltons or less.

37. (New) The polynucleotide of claim 36, wherein an observable change in the rate of catalysis of the polynucleotide occurs in 6 minutes or less after interaction with the chemical effector.
38. (New) The polynucleotide of claim 37, wherein the observable change occurs one minute or less after interaction with the chemical effector.
39. (New) The polynucleotide of claim 36, wherein the chemical effector is a small molecule selected from the group consisting of amino acids, amino acid derivatives, peptides, nucleosides, nucleotides, and steroids.
40. (New) A biosensor comprising the polynucleotide according to claims 34 or 36.
41. (New) A method for detecting the presence or absence of a compound or its concentration in a sample comprising contacting the sample with a polynucleotide according to claims 34 or 36, whereby reversible interaction of the compound with the allosteric site alters the cleavage function or configuration of the polynucleotide relative to that of a control sample, and observing said alteration in the cleavage function or configuration of the polynucleotide, wherein the compound is a chemical effector that is a metal ion or small molecule having a molecular weight of 300 Daltons or less and further wherein an alteration in function or configuration of the polynucleotide indicates the presence or absence of a compound or its concentration in the sample.
42. (New) The method of claim 41, wherein the presence or absence of a compound or its concentration is detected by observation of an alteration in the cleavage function of the polynucleotide.

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43. (New) The method of claim 42, wherein the compound is a chemical effector that is selected from the group consisting of amino acids, amino acid derivatives, peptides, nucleosides, nucleotides, and steroids.
44. (New) A polynucleotide of claim 36, wherein the rate of catalysis of the enzyme is measured by observing enzyme self cleavage or substrate cleavage.
45. (New) A biosensor of claim 40, wherein the polynucleotide is attached to a solid support.